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(54) Hinge assembly

(57) A hinge assembly which is particularly easy to assemble and disassemble, e.g. by relative movement of its members along the hinge axis, comprises two hinge plates, which may be formed by side walls 13, 18 of a metal box 10 and its lid 11, and a linking member 30. Edge portions of the hinge plates 13, 18 are formed as part-cylindrical parts 22, 23 which curve away from each other and the linking member 30 hooks around these to permit their partial rotation so that the hinge plates can move through 180° relative to each other.

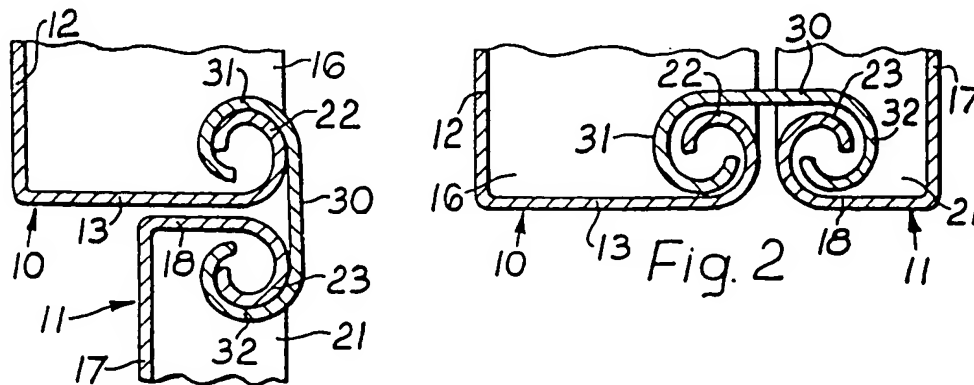


Fig. 1

Fig. 2

GB 2 117 041 A

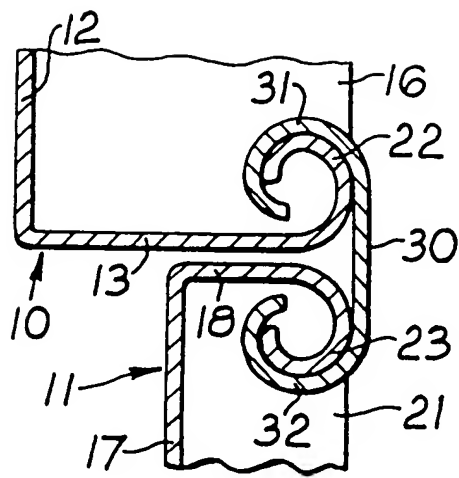


Fig. 1

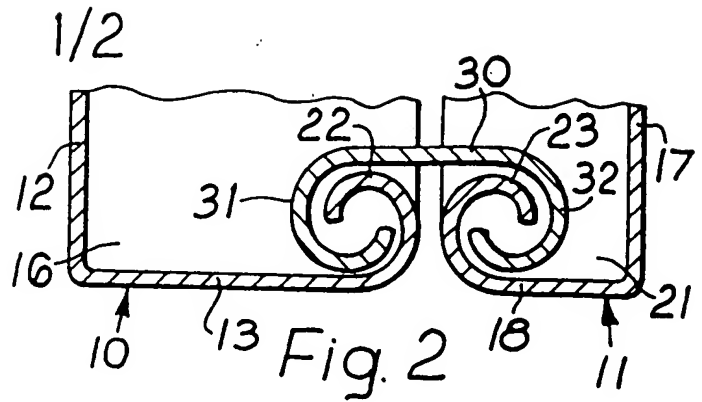


Fig. 2

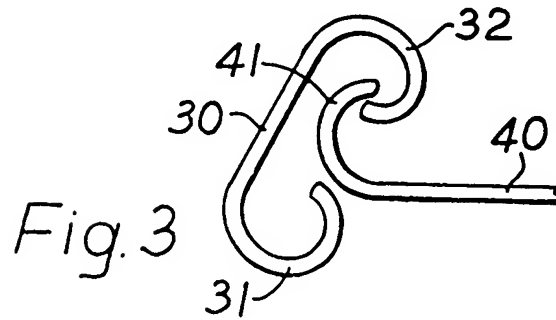


Fig. 3

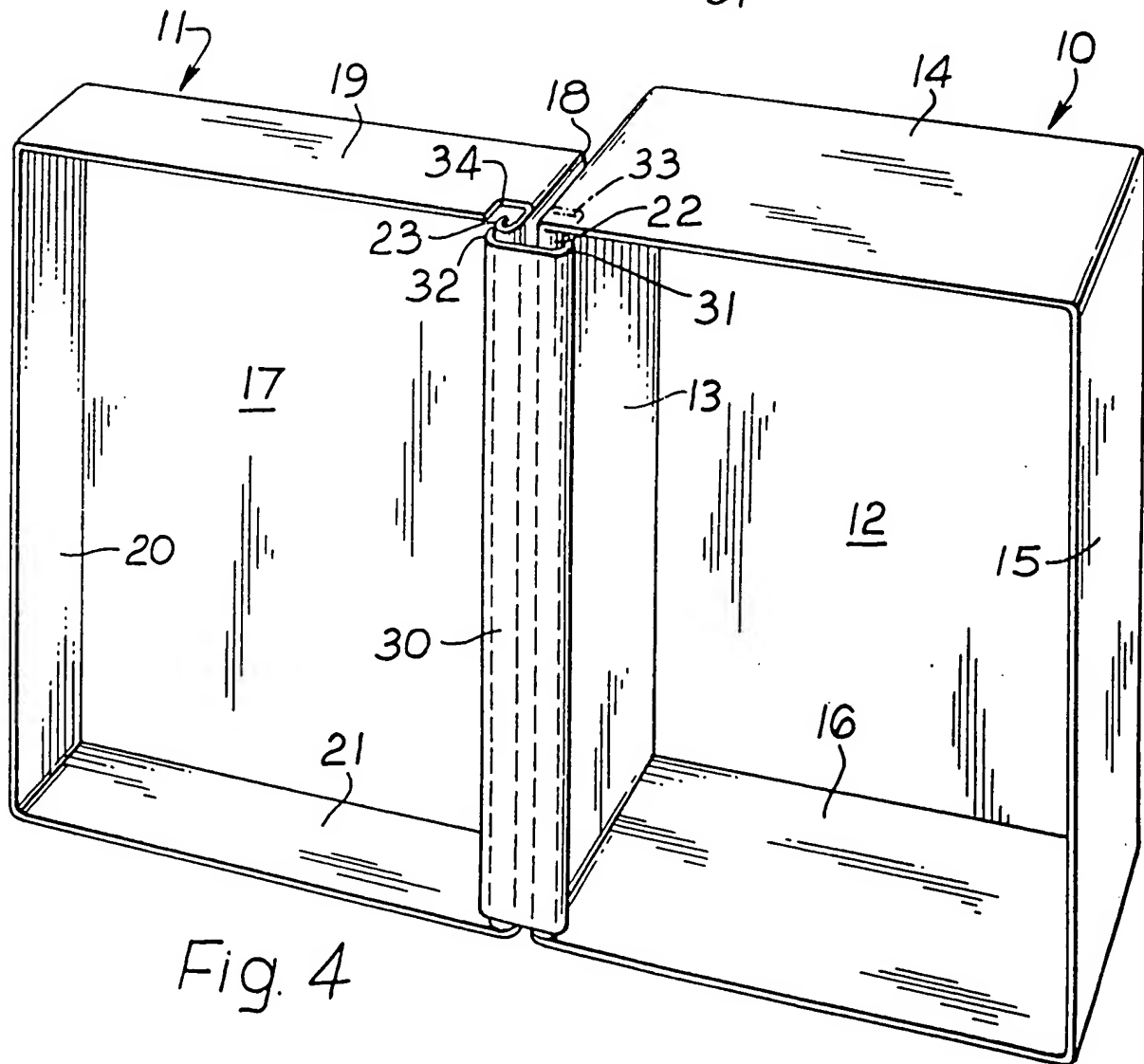


Fig. 4

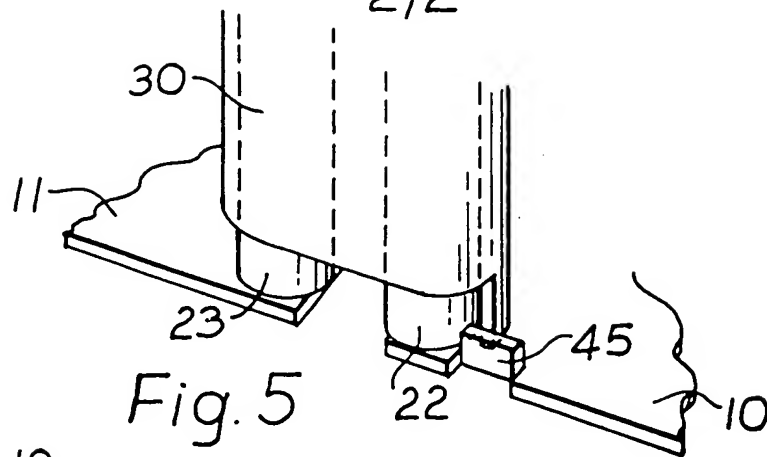


Fig. 5

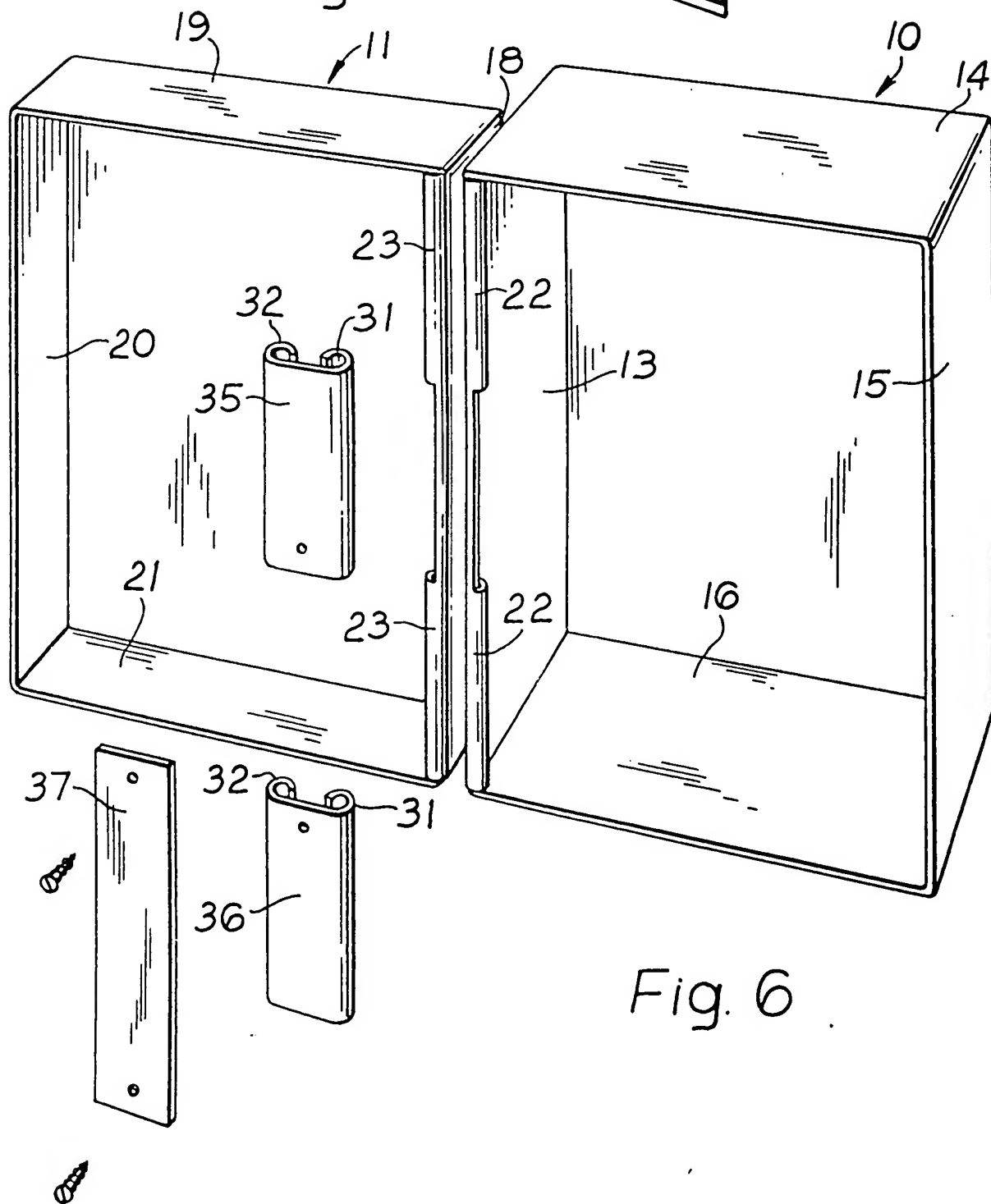


Fig. 6

SPECIFICATION

Hinge assembly

This invention relates to a hinge assembly, particularly but not exclusively for hinging a lid to a box.

An object of the invention is to provide a hinge assembly which is inexpensive to produce, easy to assemble and disassemble, neat in appearance and is capable of opening through a full 180°. Ease of assembly and disassembly is particularly important in instances where a hinge assembly is incorporated between a receptacle and a lid therefor and both of these parts contain equipment, e.g. electronic equipment. In such instances it is often far easier to install the equipment in the two separate parts before joining them together by way of the hinge assembly than if the receptacle and lid are hingeably secured together before the equipment is installed. Moreover, easy detachment of the lid from the receptacle will facilitate servicing or repair of the equipment by permitting easy access to both parts.

Pursuant hereto, the present invention provides a hinge assembly comprising two side-by-side hinge plates, respective edge portions of which are formed as part-cylindrical parts which curve away from each other, and a linking member which hooks around the part-cylindrical parts of both the plates so as to hold the hinge plates in close proximity while permitting circumferential sliding of their respective part-cylindrical parts within said linking member.

In practice it has been found suitable to provide two hinge plates with exactly corresponding part-cylindrical parts each of which curve through an angle of about 250°. The two hinge plates and the linking member may conveniently be assembled together by relative sliding along the hinge axis, although one end of at least one of the hinge plates may be blocked off to limit the manner in which these three components can be longitudinally moved relative to each other.

In certain circumstances, for instance where both ends of one hinge plate are blocked off, thereby preventing relative movement along the hinge axis, it is, however, necessary to provide that hinge plate with a part-cylindrical part of only 180° so that the linking member may be assembled with that hinge plate by hooking over transverse to the hinge axis.

The linking member is preferably an elongate strip having each longitudinal edge rolled to form a part-cylindrical part of similar shape and diameter to the part-cylindrical parts of the respective hinge plates.

The invention will be described further, by way of example, with reference to the accompanying drawings, in which:

Fig. 1 is a fragmentary cross-section of a first embodiment of the hinge assembly of the invention in its closed position and as applied to a box and its lid;

Fig. 2 is a view corresponding to Fig. 1 of the

same embodiment of the hinge assembly of the invention as applied to a box and its lid in an open position of the hinge assembly;

Fig. 3 is a diagrammatic end view of a linking member and an edge of one hinge plate of a second embodiment of the hinge assembly of the invention;

Fig. 4 is a perspective view of a box and its lid which incorporate either the first or the second embodiment of the hinge assembly of the invention;

Fig. 5 is a fragmentary perspective view to an enlarged scale, illustrating a modification at one end of the hinge assembly shown in Fig. 4; and

Fig. 6 is an exploded perspective view of a box and its lid incorporating a third embodiment of the hinge assembly of the invention.

Figs. 1, 2 and 4 illustrate how a first embodiment of the hinge assembly of the invention may be applied to the box 10 with a lid 11. The box 10 is formed of sheet metal and consists of a substantially rectangular base 12 and four side walls 13, 14, 15, 16 perpendicular thereto. The lid 11 is also of sheet metal and is very similar in form to the box 10 having a top plate 17 of the same dimensions as the base 12 and four side walls 18, 19, 20, 21 which are shallower than the walls 13, 14, 15, 16 of the box 10. One side wall 13 of the box 10 forms a first hinge plate of the hinge assembly, its upper edge being rolled to form a part-cylindrical part 22 curving through an angle of about 250° towards the interior of the box 10. Similarly, one side wall 18 of the lid 11 forms a second hinge plate of the hinge assembly, its lower or free edge being rolled to form a part-cylindrical part 23 curving through an angle of about 250° towards the interior of the lid 11. A linking member 30 consists of an elongate metal strip having each longitudinal edge rolled to form a part-cylindrical part 31, 32 of similar shape and diameter to the part-cylindrical parts 22, 23 of the hinge plates 13, 18. The linking member 30 hooks around the part-cylindrical parts 22, 23 of the respective hinge plates 13, 18 so as to hold said plates 13, 18 in close proximity while permitting circumferential sliding or partial rotation of their respective part-cylindrical parts 22, 23 within the respective part-cylindrical parts 31, 32 of the linking member 30. Thus the remaining portions of the hinge plates are capable of moving relative, to each other through at least 180°.

As shown in Fig. 4, the side walls 14, 19 of the box 10 and the lid 11 respectively which are substantially in the same plane as each other and are adjacent the side walls 13, 18 forming the hinge plates of the assembly are cut away at their respective upper and lower corners 33, 34 where they join said hinge plates 13, 18. (The cut away corner 33 of the wall 14 is shown only in broken lines.) In contrast, the opposite side walls 16, 21 of the box 10 and the lid 11 respectively which are adjacent the other ends of the hinge plates 13, 18 are not cut away and therefore block off these ends of the hinge plates 13, 18. The hinge is thus

assembled by slotting the linking member 30 downwardly, as seen in the drawing, over the part-cylindrical parts 22, 23 of the hinge plates 13, 18 along the hinge axis. With this particular

5 arrangement the hinge plates 13, 18 and thus the box 10 and the lid 11 cannot be separated by movement of the plates 13, 18 transverse to the hinge axis. Of course, the parts may easily be detached one from the other by movement along the hinge axis, namely by upward movement of the linking member 30 or downward movement of the box 10 and or the lid 11 as shown in Fig. 4.

10 Figs. 1 and 4 illustrate this embodiment of the hinge assembly in its closed position i.e. with the hinge plates 13, 18 substantially parallel to each other. In this position the lid 11 of the box 10 is fully open. Fig. 2 illustrates the same embodiment in the open position, i.e. when the hinge plate 18 of the lid 11 has been moved through at least 180° relative to the hinge plate 13 of the box 10 so that the plates/walls 13, 18 lie substantially in the same plane and the lid 11 is closed on the box 10. The linking member 30 is, of course, inside the box 10 when the lid 11 is closed which means that the exterior of the box 10 appears neat and aesthetically pleasing.

20 In a second embodiment of the hinge assembly of the invention (which is probably the preferred practical embodiment) one hinge plate 40 has a part-cylindrical part 41 which curves through only about 180°. The linking member 30 may thus be assembled with this plate 40 simply by hooking over transverse to the axis of the hinge, as illustrated in Fig. 3. When this embodiment is applied to a box with a lid, as shown in Fig. 4, only one corner of the box or lid needs to be cut away. If, for example, as illustrated only the corner 34 of the lid 11 is cut away and the corner 33 of the box 10 is not cut away (solid lines), the part-cylindrical part 22 of the wall 13 is only curved through 180° so that the linking member 30 can be hooked therearound transverse to the hinge axis. In other words, the linking member 30 cannot, in this case, be slotted longitudinally onto the hinge plate 13 of the box 10 because it is blocked off at both ends of the opposing side walls 14, 16. After the linking member 30 is fitted onto the box 10, the lid 11 can be attached by sliding it upwardly as seen in Fig. 4, along the hinge axis with its part-cylindrical part 23 located in the part-cylindrical part 32 of the linking member. Once the lid 11 is in position, the hinge plates cannot be separated by movement transverse to the hinge axis. This hinge assembly can, of course, be dismantled easily by the reverse sequence of operations.

Conversely, of course, in a modification of this embodiment the hinge plate 18 of the lid 11 can be blocked off at both ends and have a part-cylindrical part of only 180° while the box 10 is cut away at one corner to permit sliding assembly along the hinge axis. Moreover, although only one hinge plate should be blocked off at both ends (one cut away corner is essential for assembly), the part-cylindrical parts of both hinge plates may

curve through only 180° simply to standardise manufacture of the hinge plates. This type of hinge assembly is favoured in practice because there is virtually no likelihood of it being inadvertently partially dismantled by relative sliding of the lid and the box whereas the first described embodiment could more easily be inadvertently dismantled.

70 In the above-described hinge assemblies the hinge plates are capable of moving through at least 180° relative to each other. However stop means may be provided on the hinge plates and/or adjacent thereto to limit relative movement, for example, to exactly 90° or 180°. Fig. 5 illustrates such a stop 45 which limits the opening of the lid 11 to 180°. Other stop means are, of course, possible.

Fig. 6 illustrates a third embodiment of the hinge assembly of the invention as applied to a box and its lid. In this embodiment both ends of both hinge plates 13, 18 are blocked by the adjacent sidewalls of the box 10 and lid 11 thereby preventing normal axial assembly as hereinbefore described. However, the central portion of each part-cylindrical part 22, 23 extending about one third the axial length of each hinge plate 13, 18 is cut away so that linking members 35, 36 of the same configuration as previously but of length less than said cut away portions can be inserted one after the other into the cut away region and slid axially to respective ends of the hinge plates 13, 18. The two linking members 35, 36 are held apart by a distance strip 37 secured in position between said members 35, 36 in the central cut away region. In place of the strip 37, other means such as a clip may be used. Again, this embodiment can be readily assembled, as described, and readily dismantled by the reverse sequence of operations.

105 The invention has been described in relation to the hinging of a lid on a box and, indeed, it is particularly applicable to this type of lidded metal box which may be used to house electronic or burglar alarm equipment. The reason for this is, as intimated in the introduction hereto, that the proposed hinge assembly can be readily assembled and disassembled. It is advantageous to be able to install equipment in the lid and the box separately before they are attached together by means of a linking member, as hereinbefore described and when the equipment has to be serviced or repaired the lid can be easily detached so that an operative has easy access to the equipment in the lid or in the box or both. In fact, one set of equipment could be replaced, if necessary, while the other set is retained. This may be important in cases, such as burglar alarms, where the box is firmly mounted on a wall while the lid can be detached. The fact that the linking member is internal to the box is also an advantage compared to known hinges because the exterior of the box is then neat and aesthetically pleasing and it may, without any problem be painted in one colour throughout or in two contrasting colours. Known hinges tend not to be easily painted over

and look unsightly.

The invention is, however, not confined to the above-mentioned practical embodiments which should be regarded as illustrative and not
 5 limitative of its scope. For example, the proposed hinge assembly may be provided in the form of two hinge plates and a linking member, the hinge plates being adapted for attachment to elements to be hinged together, e.g. by having holes
 10 through which screws or rivets may be applied. In this case the hinge plates and/or the linking member may be formed from sheet metal or as extensions or standard sections. Moreover they can be slid together, as described, along the hinge
 15 axis and clamped to prevent disassembly. Other variations are possible.

CLAIMS

1. A hinge assembly comprising two side by side hinge plates, respective edge portions of
 20 which are formed as part-cylindrical parts which curve away from each other, and a linking member which hooks around the part-cylindrical parts of both the plates so as to hold the hinge plates in close proximity while permitting circumferential
 25 sliding of their respective part-cylindrical parts within said linking member.

2. A hinge assembly as claimed in claim 1 wherein the two hinge plates have exactly
 30 corresponding part-cylindrical parts each of which curve through an angle of about 250° .

3. A hinge assembly as claimed in claim 1 wherein the part-cylindrical part of at least one hinge plate curves through only 180° so that the linking member may be assembled therewith by
 35 hooking over transverse to the hinge axis.

4. A hinge assembly as claimed in claim 1, 2 or 3 wherein the hinge plates and the linking member may be assembled together by relative sliding along the hinge axis.

40 5. A hinge assembly as claimed in any preceding claim wherein one end of at least one hinge plate is blocked off.

45 6. A hinge assembly as claimed in any preceding claim wherein stop means are provided to limit the relative movement of the hinge plates.

7. A hinge assembly as claimed in any preceding claim wherein the two hinge plates and the linking members are extrusions.

50 8. A hinge assembly as claimed in any of claims 1 to 6 wherein the hinge plates are formed by side walls of a box and its lid.

9. A hinge assembly as claimed in claim 8 wherein a central portion of the part-cylindrical part of each hinge plate is cut away to permit
 55 insertion of two linking members which are held apart at respective ends of the hinge plates by a distance strip or clip.

60 10. A hinge assembly substantially as hereinbefore described with reference to and as illustrated by Figs. 1, 2 and 4, Figs. 3 and 4 or Fig. 6 of the accompanying drawings.